

## Complete Summary

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### GUIDELINE TITLE

ACR Appropriateness Criteria™ for obstructive voiding symptoms secondary to prostate disease.

### BIBLIOGRAPHIC SOURCE(S)

American College of Radiology (ACR), Expert Panel on Urologic Imaging. Obstructive voiding symptoms secondary to prostate disease. Reston (VA): American College of Radiology (ACR); 2001. 4 p. (ACR appropriateness criteria). [23 references]

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## SCOPE

### DISEASE/CONDITION(S)

Obstructive voiding symptoms secondary to prostate disease

### GUIDELINE CATEGORY

Evaluation  
 Screening

### CLINICAL SPECIALTY

Family Practice  
 Internal Medicine  
 Nephrology  
 Radiology  
 Urology

### INTENDED USERS

Health Plans  
Hospitals  
Managed Care Organizations  
Physicians  
Utilization Management

#### GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of radiologic examinations in investigating obstructive voiding symptoms secondary to prostate disease

#### TARGET POPULATION

Male patients with obstructive voiding symptoms secondary to prostate disease

#### INTERVENTIONS AND PRACTICES CONSIDERED

1. Transabdominal ultrasound (US) of the bladder
2. Transabdominal ultrasound of the kidney
3. Excretory urography (intravenous pyelogram [IVP])
4. Supine abdomen
5. Retrograde urethrogram
6. Transrectal ultrasound (TRUS)
7. Voiding cystourethrography (VCUG)
8. Magnetic resonance imaging (MRI) of pelvis
9. Computed tomography (CT) of abdomen/pelvis

#### MAJOR OUTCOMES CONSIDERED

Utility of radiologic examinations in the investigation of obstructive voiding symptoms secondary to prostate disease

### METHODOLOGY

#### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

#### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of recent peer-reviewed medical journals, primarily using the National Library of Medicine's MEDLINE database. The developer identified and collected the major applicable articles.

#### NUMBER OF SOURCE DOCUMENTS

The total number of source documents identified as the result of the literature search is not known.

## METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Not Given)

## RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

## METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

## DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

## METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

## DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed to reach agreement in the formulation of the Appropriateness Criteria. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as developed by the topic leader(s). Questionnaires are completed by the participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1-9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty (80) percent agreement is considered a consensus. If consensus cannot be reached by this method, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible.

## RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

## COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

## METHOD OF GUIDELINE VALIDATION

Internal Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria and the Chair of the ACR Board of Chancellors.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

Clinical Condition: Obstructive Voiding Symptoms Secondary to Prostate Disease

Variant 1: Normal renal function.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Transabdominal ultrasound of the bladder	5	Post void to measure residual urine. If significant residual, then evaluation of upper tracts is indicated. Gives estimate of prostate size.
Transabdominal ultrasound of the kidney	3	Appropriateness rating could be higher if significant residual urine were present. Evaluate for hydronephrosis.
IVP	3	Appropriateness rating could be higher if significant residual urine present. In patients with stones, hematuria, or atypical history, the study may be warranted.
Supine abdomen	2	Other imaging studies more useful.
Retrograde urethrogram	2	Does not assess prostate size.
TRUS	2	
Voiding cystourethrography (VCUG)	2	Consider in men younger than 50 with symptoms.
MRI of pelvis	2	

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT of abdomen/pelvis	1	Not indicated.
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Abbreviations: IVP, excretory urography/intravenous pyelogram; TRUS, transrectal ultrasound; MRI, magnetic resonance imaging; CT, computed tomography

Variant 2: Increased Blood Urea Nitrogen (BUN) and/or Creatinine.\*

Radiologic Exam Procedure	Appropriateness Rating	Comments
Transabdominal ultrasound of the bladder	8	To evaluate for residual urine and prostate size.
Transabdominal ultrasound of the kidney	8	To evaluate for hydronephrosis.
Supine abdomen	3	To exclude calculi. Can be used in association with ultrasound.
IVP	2	Other studies better for evaluating same structures.
Retrograde urethrogram	2	Does not assess prostate size.
TRUS	2	Can assess prostate size by transabdominal ultrasound.
VCUG	2	Consider in men younger than 50 with symptoms.
MRI of pelvis	2	
CT of abdomen/pelvis	1	Not indicated.
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

\*Refer to appropriateness criteria for renal failure as well. For example, in patients who have elevated renal function tests even after catheter drainage, renal scintigraphy should be considered.

Obstructive voiding symptoms secondary to prostate disease include hesitancy, decreased force of stream, terminal dribbling, post-void fullness, and double voiding. Benign prostatic hypertrophy (BPH) is the most common cause of prostate enlargement requiring intervention. It is estimated that by 80 years of age, 75% of men have developed BPH. It has also been estimated that 10% of all males over 40 years old will have BPH requiring surgery before reaching age 80. Each year an estimated 400,000 men undergo transurethral resection of the prostate (TURP). Other causes of bladder outlet obstruction include urethral stricture, prostate cancer, bladder neck contracture, and neurogenic disease.

Numerous imaging studies have been used in evaluating patients with symptoms of bladder outlet obstruction. These include plain films, excretory urography (intravenous pyelogram [IVP]), urethrography, both transabdominal and transrectal ultrasonography, computed tomography (CT), and magnetic resonance imaging (MRI). With the coming reengineering of health care, selective use of these modalities will be required in order to decrease costs and practice efficient, effective medicine.

Plain-film radiography cannot be used to visualize the prostate directly. A distended bladder can be visualized as a pelvic mass, but unless information is available regarding when the patient last voided, this finding is of uncertain value. Prostatic calcifications can be visualized and always indicate glandular enlargement if they extend above the pubic symphysis. Bladder calculi can also be easily identified. In patients with prostate cancer and bone metastases, plain films are a valuable and inexpensive diagnostic tool. Eighty percent of bone metastases are osteoblastic, and mixed osteoblastic and osteolytic lesions are seen in another 15% of patients. However, bone scintigraphy is far more sensitive in identifying bone metastases at an early stage.

The routine use of IVP is not recommended. In patients who have stones on plain films, hematuria, or an atypical history, however, IVP may be warranted. There is no evidence that patients with BPH have a higher incidence of asymptomatic renal cancers than the general population in the same age group; therefore, an IVP to search for occult neoplasms is unwarranted. In a prospective study of 502 patients, researchers found benign renal cysts in 10%, renal cancers in less than 1%, and significant upper urinary tract obstruction in 2.6%. When patients have obstructive symptoms and renal insufficiency, ultrasound (US) rather than IVP is recommended to evaluate for hydronephrosis. In patients with severe hydronephrosis, azotemia is almost always present, and ultrasound is indicated. In summary, while not routinely recommended, upper urinary tract imaging is indicated in patients with benign prostatic hypertrophy (BPH) and either hematuria (including asymptomatic microscopic), laboratory evidence of renal insufficiency, history of urinary tract infection, urolithiasis, previous urinary tract surgery, or congenital or acquired renal disease.

Retrograde urethrography is valuable to exclude urethral strictures but does not accurately assess the size of the prostate gland. As such, it is not part of the routine evaluation of patients with prostatism. Voiding cystourethrography should be considered only for men younger than age 50 with outflow obstruction symptoms.

Sonography can be used to evaluate the prostate transabdominally (through a distended bladder) or transrectally (TRUS). TRUS is preferred by urologists. The ultrasound pattern is still too nonspecific to differentiate benign from malignant prostate lesions. TRUS is, however, used to guide lesion-directed and systematic biopsies of the prostate. It has been suggested that ultrasound contrast agents will make the appearance more sensitive and better direct the biopsies to achieve a higher positive yield. Three-dimensional (3D) ultrasound may prove to be of value in the future. Secondary changes of bladder outlet obstruction, such as bladder wall thickening, are better seen with ultrasound than IVP. The size of the enlarged prostate can be detected accurately by suprapubic (transabdominal) ultrasound, TRUS and magnetic resonance (MR). TRUS and MRI have an advantage in that the internal prostatic anatomy is better seen and information with respect to the ratio of glandular to stromal tissue in the prostate can be determined. This may be useful in the future in selecting patients for specific treatment options. Identifying the size of the prostate is important since it helps determine the type of therapy indicated.

One of the complications of transurethral resection of the prostate, water overload is thought to be the result of excessive operating time due to the gland size. In very large glands, which can be measured with ultrasound preoperatively, an open procedure may be preferred. Abdominal (suprapubic) ultrasound may also be used to accurately (plus or minus 15%) measure residual urine volume in 90% of patients. However, catheterization is probably the least expensive method to accurately assess residual urine in the bladder.

In patients with azotemia, the collecting system of the kidneys should be imaged for dilatation. In patients with normal renal function, this may not be necessary. However, in a study of 128 patients, it was reported that hydronephrosis can be present with normal biochemical results.

The Clinical Practice Guideline of the Agency for Healthcare Research and Quality (AHRQ) (formerly the Agency for Health Care Policy and Research [AHCPR]) states that imaging of the upper urinary tracts by ultrasound or IVP is "not recommended unless patients have one or more of the following: hematuria, urinary tract infection, renal insufficiency, history of urolithiasis, or history of urinary tract surgery".

Computed tomography has not proven to be of much value in evaluating the benign, enlarged prostate. There are reports of the value of MRI in evaluating the prostate gland. MRI is also useful in evaluating prostate size, although other less costly procedures, such as ultrasound, are preferred.

In summary, in patients who have normal renal function but suffer the symptoms of prostatism, a radiographic work-up should be minimal. Ultrasound is occasionally desirable for estimating prostate size prior to surgery. If azotemia is present, the upper urinary tract should definitely be evaluated with ultrasound for the presence of hydronephrosis.

#### CLINICAL ALGORITHM(S)

None provided

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

- Appropriate surveillance of radiologic examinations used to investigate obstructive voiding symptoms secondary to prostate disease
- Transrectal ultrasound (TRUS) and magnetic resonance imaging (MRI) better show the internal prostatic anatomy, and information with respect to the ratio of glandular to stromal tissue in the prostate can be determined.

### POTENTIAL HARMS

Not stated

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other coexistent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Getting Better

### IOM DOMAIN

Effectiveness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

American College of Radiology (ACR), Expert Panel on Urologic Imaging. Obstructive voiding symptoms secondary to prostate disease. Reston (VA): American College of Radiology (ACR); 2001. 4 p. (ACR appropriateness criteria). [23 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

1995 (revised 2001)

### GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

### SOURCE(S) OF FUNDING

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria™.

### GUIDELINE COMMITTEE

ACR Appropriateness Criteria™ Committee, Expert Panel on Urologic Imaging

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#### FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

#### GUIDELINE STATUS

This is the current release of the guideline. It updates a previous version: Bluth EI, Amis ES, Bigongiari LR, Bush WH, Choyke PL, Fritzsche P, Holder L, Newhouse JH, Sandler CM, Segal AJ, Resnick MI, Rutsky EA. Obstructive voiding symptoms secondary to prostate disease. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):693-6.

All Appropriateness Criteria™ topics are reviewed annually and updated as appropriate.

#### GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the [American College of Radiology \(ACR\) Web site](#).

Portable Digital Assistant (PDA): ACR Appropriateness Criteria™ - Anytime, Anywhere (PDA version) is available from the [ACR Web site](#).

Print copies: Available from the American College of Radiology, Department of Quality & Safety, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

#### AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- American College of Radiology ACR Appropriateness Criteria™ introduction. Reston (VA): American College of Radiology; 6 p. Available in Portable Document Format (PDF) from the [ACR Web site](#).

#### PATIENT RESOURCES

None available

#### NGC STATUS

This summary was completed by ECRI on May 6, 2001. The information was verified by the guideline developer as of June 29, 2001. This summary was

updated by ECRI on September 8, 2004. The updated information was verified by the guideline developer on October 8, 2004.

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